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Canadian Beaver *(Castor canadensis)*

Photo through the courtesy of the U. S. Fish and Wildlife Service

Fur Animals — A Valuable Natural Resource

FRANK G. ASHBROOK*

Furs are taken in every State of the Union, even in the outskirts of Chicago, and New York. But of all the fur-producing sections of this country none exceeds the Mississippi Basin. This may seem strange, but the fact remains that the territory between the Alleghanies and the Rockies and from Canada to the Gulf, bountiful as it is in agricultural wealth, is teeming also with wild animal life.

The very ground and soil on which Chicago is located was for many centuries in the past the happy hunting grounds for trappers and fur traders. It was here to the rich soil of Illinois, amid the blowing of the wind across Lake Michigan, the cry of wolves, and the shouts of the Indians in play or in battle, that French explorers came from the East on trails blazed through forests and traced over mountains by fur trappers.

In the early 17th Century, Samuel de Champlain penetrated through the forests and plains of the shores of Lake Huron situated due north of the Chicago of today. About two generations later, other French explorers came from eastern French Canada in search of new natural resources with which to enhance the wealth of the spendthrift King, Louis XIV. Robert, Cavalier Sieuer de la Salle, Joliet, Tonty, Hennepin, and Pere Marquette are bywords in the early history of Chicago and the surrounding country. La Salle, who was born exactly 300 years ago—in 1643, came to what then was known as the Checagou Country, and named that region Illinois. These explorers, although brave and courageous, knew little of the American continent and its geography. They were guided by frontiersmen and fur trappers who laid the trails through the forests and over mountains and plains.

During the period of early settlement of this country, fur animals provided one of the great sources of income for the nation, and no class of wildlife was so ruthlessly exploited. Pursuit of the fur wealth was the incentive for the exploration of much of the country.

For centuries our country had furnished fur for the Indians, yet in a few years it was practically stripped of it by the greedy fur traders who made the market for the white trappers and for the Indians as well.

As early as 1825, trappers were pushing far back into the wilds of the Pacific Northwest, the last great unexploited fur area within the present boundaries of the United States. Looking for beavers they stripped the streams of them as rapidly as found, in the final interest of the Hudson's Bay Company, the Astors, and other American traders. Naturally, the decline of the fur resources was rapid.

*Fish and Wildlife Service, U. S. Department of the Interior.

A brief backward glance will show what has happened to our fur resources to make conservation in the wild so essential and propagation on fur farms a lucrative undertaking of such great promise. In almost every civilization furs have been about the most valued article of commerce. This was true of the Chinese 3,500 years ago, and later among the Greeks and the Romans. In medieval Europe fur was a luxury much sought after—and incidentally, men made greater use of it for clothing than did women. It was not until after the discovery of North America, of course, that the world fur trade really got into its stride. That it early became an enormously profitable business on this continent is attested by the fact that an Indian trapper could often be induced to part with his winter's catch, worth hundreds of dollars, for a blanket or two and a bottle of rum—and perhaps not very good rum. Among the great fortunes amassed in this game the outstanding example is that of John Jacob Astor.

In these circumstances, with pelts readily obtained and profits large, no attention whatever was paid to the question of the possible exhaustion of this source of wealth that nature distributed with a prodigal hand. The more furs there were on the market, the more popular furs became. The luxury of the rich became the necessity of the moderately well to do. The trap lines were run not less but more intensively, to the profit of everyone—the professional trapper, the landowner, the farmer who could turn a few extra dollars without much trouble, and a large army of wholesalers, factory owners and workers, and retailers and their employees.

Naturally a depletion of fur resources resulted. This cannot be attributed, however, entirely to overeagerness in trapping. The disappearance of the wilderness, natural habitat of the fur animals, was a major factor. Nevertheless, even today the trappers and fur farmers of the United States receive $60,000,000 a year for the raw furs they bring to the market. The annual retail turnover is several times that amount; today it has reached half a billion dollars. The United States is in fact the largest fur-consuming country in the world.

And now, the United States is the World's chief source of fur supply, but the country does not produce enough to meet more than a third of its own demand. Prior to World War II twice as many foreign as domestic furs were used in this country and the demand is increasing rather than decreasing. To meet this demand, trappers still take fur animals from the wild with the same extravagant disregard of maintaining or increasing whatever supply is left. Unless measures are taken to strike a proper balance between supply and demand our fur resources will be completely exhausted.

In this connection there is much need for greater knowledge regarding production. At present no one knows what would constitute

a proper balance. We do not know, for example, whether we are producing 10,000,000 muskrats a year and trapping 13,000,000 or producing 5,000,000 and trapping 25,000,000. We can be reasonably sure that we are trapping more than we are producing; but it is important to find out how many more. Almost every state has some fur resources that are a source of income for some of its citizens. The methods of handling these resources are almost entirely haphazard, and in fact few state game and conservation commissions have given sufficient serious thought to the matter. In most states there is no provision for keeping a record of the furs taken each year. Until every states does establish some method of recording the number of furs taken, no one will know how many fur animals representing the various species are trapped annually in the entire United States.

The fur trade, in all its branches, is one of our important commercial industries. Few people outside the trade itself have any adequate conception of this. One realizes, of course, that it represents a large investment and a huge annual turnover in money, raw materials, and manufactured products. It furnishes gainful employment to many thousands and gives warmth and enjoyment to many more thousands of people.

The production and conservation of fur animals in the wild during the past ten years has not only kept some of our finer species from utter extinction but has insured a continuing supply. It is difficult to understand the limited active interest on the part of the fur trade in matters pertaining to the protection and increase of fur animals. Here is an industry whose very existence depends upon a natural resource over which it cannot exercise any direct control. Yet trappers, country collectors, raw-fur receiving houses and other branches of the fur trade year after year take as many furs as they can possibly get with only the profit motive in mind.

What about the future? The future necessarily is uncertain and surely the day will come when farmers, land owners, trappers, and country collectors will have to scratch for a living. Within the next two years thousands of trappers may return to the fields and woods. They should not be permitted to clean out the breeding stock of fur animals or the entire crop that will be produced during the next two breeding seasons. I am not advocating the shortening of prevailing trapping seasons, although in some instances that seems necessary; but in some states a constructive effort might well be made to set aside restricted areas as preserves for fur animals and thereby increase the production and build up this natural resource. This would not only serve to insure a constant supply of furs in years to come but would also provide the farmers and landowners with additional revenue and per-

petuate the fur trade. Unless we can produce greater quantities of furs in this country much of the trade will pass into the hands of foreign countries which produce large quantities of furs and exercise a close control over the supply.

Bringing back the beaver is an outstanding achievement in conservation. This fur animal whose extermination was our first big business has been put to work to save us from our own abuse of the land.

The dam-building beaver—or master engineer, as he is called—is known to most people in the United States. His unusual ability in building dams and constructing canal systems has led to considerable speculation as to his intelligence. Some scientists minimize the mental capacity of this rodent and stress what they term his "specialized instinct." Call it what you may, the capability of the beaver cannot be denied. Perhaps the unusual ability some men have for making money is not always the fruit of intellectual effort, but likewise a "specialized instinct." When reference is made to the beaver's intelligence it is not necessarily meant to imply that it gamboled in the field of abstract speculation, but rather along the more practical line of engineering. Of the former, who can tell? Of the latter we have concrete evidence in the canals, dams and lodges that it constructs. In its building operations the beaver adapts its procedure to the circumstances that happen to exist. This is an evidence of intelligence in engineering.

Beaver, the builder of a continent, has never received the credit due him. Like others of rank and importance, he is social, a home and community builder, a monogamous mate. These ideals he maintained in all the desirable water habitats of North America.

Beavers are responsible for building up valuable bottom lands by checking, through pond construction, rapidly flowing flood waters filled with soil, thus permitting sedimentary deposits. Many fine meadows in the United States had their origin in the industry of the beaver, which built dams, cleared away trees, and, when its artificial lakes were finally filled with silt, removed to other localities.

Farmers, however, are primarily interested in crops that furnish food for human beings and livestock. Fur, as a crop from the land, is not given much consideration, even though it gives a liberal winter income to country folk. Streams flowing through farm lands provide beavers with homes so located as to enable them to damage vegetable and grain crops. Hay meadows are flooded, orchards are damaged, wood lots suffer, and rich soil is carried away when floods result. Irrigation and diking districts are damaged by extensive burrowing. The necessity for controlling beavers in such situations is apparent.

The Fish and Wildlife Service of the Department of the Interior was quick to realize this. It occurred to us that it would be a wiser policy to treat the beaver as a valuable resource worthy of cultivation

than as a nuisance to be suppressed or eliminated. Restoring and establishing the beaver permanently as a natural resource was a problem for study.

We learned early that rather than kill them and take the fur, the logical procedure was to transfer them to a more suitable habitat. Ideal places were found on streams in national and state forests and parks and in wildlife refuges and private estates away from roads, trails and cultivated fields. Our field men went to work and developed live beaver traps, holding pens, methods of transporting and restocking beavers. By working in this manner we made converts who believe in the beaver as a force in flood control and the conservation of water.

Recognition of these services developed an appreciation of the economic possibilities of the beaver among farmers, stockmen and foresters, as well as officials of other federal agencies in charge of public lands. In due course the viewpoint found wider acceptance.

Observation over years shows that this far-sighted policy with respect to the beaver as a factor in soil and water conservation and in restoring an important fur resource is being recognized and appreciated. Federal and state agencies are reforesting on a large scale for watershed protection. Beavers can play an important role in these developments if they are introduced on mountain tributary streams that drain from large watersheds.

For many years in the West and Midwest the work of live trapping and transplanting beavers has been in progress. Areas in the national forests, national parks, state forests, and reclamation projects have been stocked with beaver.

The chief reason for backwardness in recognizing the possibilities of heavier production was doubtless the very novelty of the situation. The idea of the beaver as a source of income was new to present generations and the questions arising in connection with its management and control under modern conditions are new anywhere. The farmers and landowners have now learned that the beaver constitutes a natural resource of real importance. The annual income from the beaver catch, while it constitutes only about one-fiftieth of the value of the total nation-wide fur catch, represents an appreciable addition to income from regular occupation.

Stating it another way, the people of the United States who trapped beaver last year were collectively better off by at least $1,250,000 than they would have been without the beaver. One hundred thousand beavers have been trapped the past season and the pelts have been sold in the raw fur markets. This is a considerable increase over previous years and is the result of cooperative efforts on the part of state and federal governments to reestablish this animal as a permanent wildlife resource.

What is a Naturalist? A Study in Natural History

KARL P. SCHMIDT[1]

3. SOME BOOKS OF TRAVEL BY MODERN NATURALISTS

Within the limits of a brief essay it is impossible to do more than sketch the more important types of travel books produced by the modern naturalists who inherit the tradition of the naturalist-travellers of the nineteenth century, and who attempt to carry it on. There are worthy successors to the classical era of Darwin, Wallace and Bates in our own times, and it is gratifying to the writer to pay his respects to books that have influenced him profoundly, and to their authors, not a few of whom have been his friends.

Travel in the twentieth century rapidly became easier than it had been in the preceding century, and numerous parts of the world became more accessible, or for the first time accessible at all. The dream of a highway from Buenos Aires to Chicago, and indeed from the Straits of Magellan to Alaska, is now on the verge of fulfillment. Not one, but several motor roads now cross the Andes, even reaching heights of 16,000 feet. Exploration by air makes the most remote places accessible, and steadily more accessible. Far places are only too easily romanticized and it is perhaps well to remind ourselves that natural history begins at home, and that for the world of small creatures, and especially of the insects and the humbler invertebrates, exciting discoveries of strange instincts and even of the less meritorious discoveries of "species new to science" still await us in our own backyards.[2] Such studies may often be quite at the amateur level, but in the sciences the way is always open to the amateur to outdo the professional, or to become one.

One of the great allies of the scientist, the artist who interests himself in natural history, is no new recruit to the field of natural history writing, whether as illustrator of the books of others or himself as author. Nevertheless, the most conspicuous works of this sort, much as they rest on the standard set by Audubon more than a hundred years ago, have appeared only in our own era. It was too long traditional for the illustration of the life of the world to depend on artists, however able, to draw from those mere tokens of the living creatures known as museum specimens. Two Englishmen enjoy a notable reputation for

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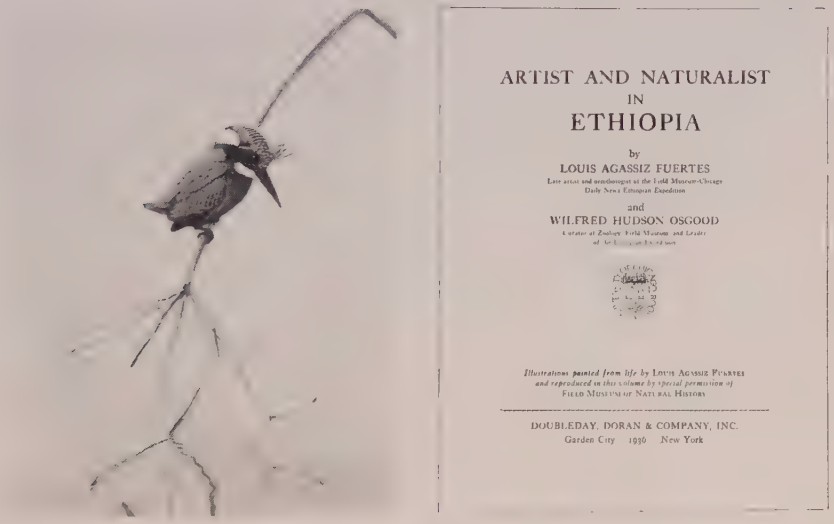
[1]Chief Curator of Zoology, Chicago Natural History Museum.

[2]Howes, P. G., 1927. Backyard exploration. Doubleday, Page and Co., Garden City, New York, xvi+211 p., frontisp., 215 fig..

Lutz, F. E. 1941. A lot of insects; entomology in a suburban garden. G. P. Putnam's Sons, New York, viii+304 p., illus.

Teale, E. W., 1942. Byways to adventure a guide to nature hobbies. Dodd, Mead and Co., New York, x+222 p., illus.

their first-hand illustration of the animals of Great Britain, of wilder parts of the world and especially of the fauna of Africa. Their books include numerous examples of those studies from life that are the life blood of the work of the naturalist-artist. *A Breath from the Veldt* by J. G. Millais was published in 1895. His *Far Away up the Nile*[3] falls into our own period. Abel Chapman's reputation as a hunter and naturalist was likewise established by books on Spain and Norway that appeared before the turn of the century; his later books, with some salty



Title page and frontispiece from *Artist and Naturalist in Ethiopia*.

criticism of the professional zoologists, are *Savage Sudan* and *The Borders and Beyond*.[4] Louis Agassiz Fuertes will come to mind as an American naturalist-traveller whose reputation is primarily that of an animal-artist. His diary from his last great expedition has been conjoined by W. H. Osgood with his own as a memorial to their long

[3]Millais, J. G., 1924. Far away up the Nile. Longmans, Green and Co., London, xii+254 p., map, 54 illus.

[4]Chapman, Abel, 1921. Savage Sudan its wild tribes, big-game and bird-life. Gurney and Jackson, London, xx+452 p., map, 248 illus.

———— 1924. The borders and beyond Arctic-Cheviot-Tropic. Gurney and Jackson, xxi+489, 19 col. pl., 197 illus., 2 maps.

friendship and to their association in Abyssinia.[5] Wholly different as is both the writing and the drawing of Ivan T. Sanderson, his three books about his travels as a naturalist, illustrated by pencil drawings remarkable for tasteful composition, may be mentioned here,[6] rather than in some paragraph where his company might not be welcomed. His ambition is to make ecological observations and to generalize from them. His success has been as a collector of museum specimens accompanied by excellent field notes. Sanderson has a personalized style, staccato with the pronoun I, very disagreeable to this writer, but defended by critics whose reputation is literary. It should perhaps be noted that the record of these critics (I refer to the board of selection for the Book-of-the-Month Club) exhibits peculiarly erratic judgment in the fields of science and travel.

Dean of the artist-naturalist-writers in North America, and with sound scientific accomplishments, Ernest Thompson Seton is known to a host of readers for his animal stories, which are directed mainly to a more juvenile audience and which frankly personify the animal characters. It was a calamity to American natural history that the octavo edition of his more serious work, *Lives of Game Animals,* should have been published in so small an edition as to be long out of print. The only book of travel by Seton that requires mention is *The Arctic Prairies.*[7]

To be named with the artist-travellers is the taxidermist-sculptor-inventor Carl Akeley, whose book, *In Brightest Africa,*[8] not only records the love of the African scene implied in the title, but tells the story of two of the most hair-raising adventures with wild animals since Selous and gives important insights into the history of museum methods and of the two great museums, in Chicago and New York, with which Akeley was associated.

The artist-naturalist group includes numerous other talented moderns—George Miksch Sutton,[9] for example. As in some degree its hero, I must forego my adverse comments on the book of travel[10] that

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[5]Fuertes, Louis Agassiz, and Wilfred H. Osgood, 1936. Artist and naturalist in Ethiopia. Doubleday, Doran and Co., Garden City, New York, xi+249 p., frontisp., 15 col. pls.

[6]Sanderson, Ivan T., 1937. Animal treasure. Viking Press, New York. 7-325 p., illus.
——— 1939. Caribbean treasure. Viking Press, New York. 7-292 p., illus.
——— 1941. Living treasure. Viking Press, New York. 11-290 p., illus.

[7]Seton, Ernest Thompson, 1917. The Arctic prairies a canoe-journey of 2,000 miles in search of the caribou being the account of a voyage to the region north of Aylmer Lake. Charles Scribner's Sons, New York, xii+308 p., illus. [New Uniform Ed.: first ed. 1911].

[8]Akeley, Carl E., 1924. In brightest Africa. William Heinemann Ltd., London, xvii+267 p., frontisp., illus.

[9]Sutton, George Miksch, 1934. Eskimo year a naturalist's adventures in the far north. Macmillan Co., New York, xii+321 p., illus.

[10]Shurcliff, Sidney N., 1930. Jungle islands, The "Illyria" in the South Seas. G. P. Putnam's Sons, New York, xv+298 p., frontisp., illus.

resulted from my own long voyage through the Pacific with Walter Alois Weber, whose first published paintings of birds and fishes appear in it.

The developments of photography in modern times have naturally been seized upon to supplement the records of travel and indeed to establish a whole new department of endeavor in the field of Natural History. Frank M. Chapman, dean of American ornithologists, played a most active part in establishing the value of photography as a tool of the naturalist, and his own books largely reflect this interest.[11] I shall return to his later books below.

Some names that come immediately to mind in connection with wild animal photography will be Shillings,[12] Dugmore,[13] and Champion.[14] The list could of course be greatly expanded. Of the moderns who have turned also to the motion picture medium I mention only Wendell and Lucie Chapman.[15] A specialized but most important type of wild animal photography is the flash-light technique that brings nocturnal animals within the range of the camera—frogs and other accessible creatures can be photographed very simply, mammals require more elaborate apparatus. The interested reader is referred again to Shillings, and especially to the books of George C. Shiras[16] and Tappan Gregory.[17] It is unfortunate that Herbert Lang, notable collector, photographer, and organizer of great expeditions for various museums, has not embodied his experiences in a book.

The lure of the Sudan lies not only in its accessibility from Europe. It is on the direct flyway of migrating European birds. Perhaps it is natural that Bengt Berg, one of the born naturalists among the naturalist-photographers, should have followed the cranes from the tundra of his native Sweden to the vast marshes of the upper Nile.[18] His books

[11]Chapman, Frank M., 1908. Camps and cruises of an ornithologist. D. Appleton and Co., xvi+432 p., frontisp., illus.

[12]Schilling, C. B., 1907. Mit Blitzlicht und Büchse neue Beobachtungen und Erlebnisse in der Wildnis inmitten der Tierwelt von Aquatorial-Ostafrika. R. Voigländer, Leipzig, xix+558 p., frontisp., illus.

[13]Dugmore, A. Radclyffe, 1910. Camera adventures in the African wilds, being an account of a tour months' expedition in British East Africa, for the purpose of securing photographs from life of the game. William Heinemann, London, xviii+231 p., frontisp., illus.

[14]Champion, F. W., 1927. With a camera in tiger-land. Chatto and Windus, London, xviii+223 p., frontisp., illus.

[15]Chapman, Wendell, and Lucie Chapman, 1937. Wilderness wanderer; adventures among wild animals in Rocky Mountain solitudes. Charles Scribner's Sons, New York, xvi+318 p., illus.

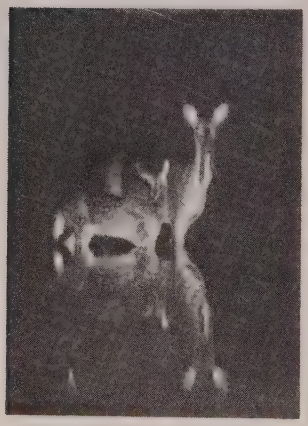
[16]Shiras, George, 3d., 1935. Hunting wild life with cameras and flashlight a record of sixty-five years' visits to the woods and waters of North America. Nat. Geogr. Soc., Washington, 2 vols., xxi+450 p., viii+450 p., 950 photos.

[17]Gregory, Tappan, 1939. Eyes in the night. Thomas Y. Crowell Co., New York, xi+243 p., illus.

[18]Berg, Bengt, 1930. To Africa with the migratory birds. G. P. Putnam's Sons, New York, 274 p., illus. [Translated by F. R. Barton.] All of Bengt Berg's books are to be recommended.

have been translated into German and English, for his text is as interesting as his pictures are distinguished.

Perhaps the most notable series of volumes on exotic natural history by a living writer is to be found in the long list of books by William Beebe. These fall rather naturally into groups. His first two books of travel[19] resulted from joint travels with his wife. The sumptuous four-volume *A Monograph of the Pheasants,* in folio size, resulted from studies that included seventeen months' travel in India and Malaysia



EYES
IN THE
NIGHT

BY TAPPAN GREGORY

THOMAS Y CROWELL COMPANY
New York NINETEEN THIRTY NINE

Title page and frontispiece from *Eyes in the Night.*

(1909-1911). *Pheasant Jungles*[20] reports this field work. Meanwhile, Beebe returned to British Guiana from year to year with varying groups of associates, usually including John Tee-Van, other future naturalists of note, and an occasional "Old Bison" (including the author of the

[19]Beebe, C. William, 1905. Two bird-lovers in Mexico. Houghton, Mifflin and Co., New York, xiii+407 p., illus.

Beebe, Mary Blair, and C. William Beebe, 1910. Our search for a wilderness an account of two ornithological expeditions to Venezuela and to British Guiana. Henry Holt and Co., New York, xix+408 p., illus.

[20]Beebe, William, 1927. Pheasant jungles; with 60 illus. from photographs by the author. G. P. Putnam's Sons, New York, xiii+248 p., illus.

term).[21] The Guiana station produced enough essays on the forest life of its vicinity to make three volumes.[22] These books are still required reading for any traveller with the least pretension to interest in natural history who intends to visit the American tropical forest region. Aside from their somewhat florid style,[23] it has been objected that they give a somewhat mistaken impression of the wealth of life to be seen at any one time in the tropical forest; but if natural history is to be written at all, this is perhaps unavoidable. There is need for an essay, however, on the dearth of visible life in the rain forest.

Beebe's next travels and books about them embody his interest in the Galapagos Islands and introduce also what is to be his next great interest. The Galapagos have been a focus of interest for naturalists since Darwin's visit in 1835. It is somewhat exasperating to find that the quarto-size *Galapagos: World's End*[24] rests on less than 100 hours of actual stay on the islands for study. *The Arcturus Adventure*[25] fortunately supplements the Galapagos experience. The first oceanographic objective of the *Arcturus* expedition was the Sargasso Sea, a focus of romantic and mythologic interest, but biologically an oceanic desert. Fortunately, the expedition could turn to the teeming waters of the Humboldt Current where they wash the shores of the Galapagos.

Oceanographic studies of one kind or another continued to interest Beebe, and led to the establishment of a laboratory base for such studies in Bermuda.[26] This laboratory has produced much excellent scientific investigation, over and above the spectacular descents with the "bathysphere." Later voyages, for which private yachts were placed at his disposal, have been to the Gulf of California and the west coast

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[21] William Morton Wheeler.

[22] Beebe, William, 1918. Jungle peace. Henry Holt and Co., New York, xi+293 p., illus.
———— 1921. Edge of the jungle. Henry Holt and Co., New York, 3+303 p., illus.
———— 1925. Jungle days. G. P. Putnam's Sons, New York, v+201 p., illus.

[23] "But untold centuries of unconscious necessity have made these tree-frogs infallible weather prophets, and the liberating rain soon sifted through the jungle foliage. In the streaming drops which announced from the curled leaf, tadpole after tadpole hurtled downward and splashed headlong into the water; their parents and the rain and gravitation had performed their part, and from now on fate lay with the supertads themselves—except when a passing naturalist brought new complications, new demands of Karma, as strange and unpredictable as if from another planet or universe." *Edge of the Jungle*, p. 139.

[24] Beebe, William, 1924. Galapagos world's end. G. P. Putnam's Sons, New York, xxi+443 p., 24 col. illus., 83 photos.

[25] Beebe, William, 1926. The Arcturus adventure an account of the New York Zoological Society's first oceanographic expedition. G. P. Putnam's Sons, New York, xix+439 p., 77 col. pl. and photos.

[26] Beebe, William, 1932. Nonsuch: land of water. Brewer, Warren and Putnam, New York, xv+259 p., illus.
———— –, 1934. Half mile down; published under the auspices of the New York Zoological Society. Harcourt Brace and Co., New York, xix+344 p., 123 illus., 8 col. pl.

of Mexico.[27] One might almost advise a would-be naturalist, the height of whose ambition is probably to join a "Museum Expedition," that he need only develop a competent knowledge of some group of animals and learn to write like Mr. Beebe in order to be offered the convenience of a private yacht for his explorations. Without going into the counter arguments for the mainly praiseworthy use of existing equipment, I venture to quote a pregnant footnote from Alfred Russel Wallace, published long ago in another connection, but still and here pertinent:

> I cannot avoid here referring to the enormous waste of labour and money with comparatively scanty and unimportant results to natural history of most of the great scientific voyages of the various civilized governments during the present century. All these expeditions combined have done far less than private collectors in making known the products of remote lands and islands. They have brought home fragmentary collections, made in widely scattered localities, and these have been usually described in huge folios or quartos, whose value is often in inverse proportion to their bulk and cost. . . . The employment in each of our possessions, and those of other European powers, of a resident naturalist at a very small annual expense, would have done more for the advancement of knowledge in this direction than all the expensive expeditions that have again and again circumnavigated the globe.

There is now a long list of associates and assistants on Beebe's various projects and expeditions who have become well-known scientists or naturalists (or both) in their own right.[28] Such training of their junior staffs is perhaps the best counter-argument to Wallace's low opinion of the "Expedition." I have myself profited from the training provided by a long voyage in a sailing yacht; but it is my conviction that funds available for museum exploration should be spent in programmed field work, and that the day of the newspaper-publicized expedition is, or should be, past. In Beebe's own career, evaluated by means of the series of books under review, his more continuously operated stations have been vastly more productive than his voyages, even when, as for the *Arcturus*, he was able to fit up a floating laboratory.

I have thus far been able to group books of travel by naturalists somewhat into categories according to the main interests or reputations of their authors. Beebe may well serve to bridge the transition from the sportsman-artist-photographer background to the more strictly scientific. He writes himself as "scientist-author," which I would invert, without disparagement. It is especially the wealth of descriptive adjectives, accurately used, that marks his writings as literary natural history.

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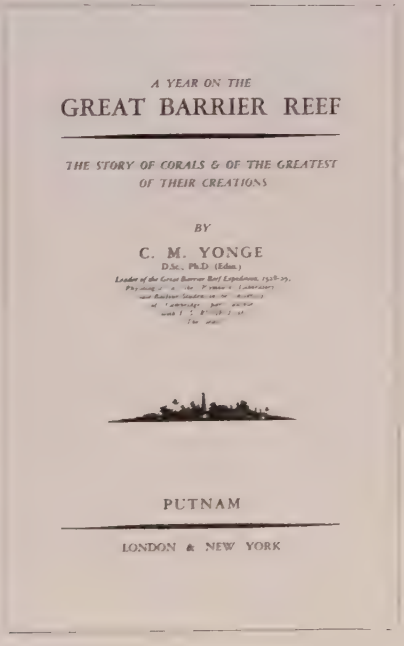
[27]Beebe, William. 1940. Zaca venture; with 24 illus., published under the auspices of the New York Zoological Society. Harcourt, Brace and Co., New York, xvi+308 p., illus.

———— 1942. A book of bays. Harcourt, Brace and Co., New York, xviii+302 p., illus.

[28]For example, A. E. Emerson, C. H. Pope, John Tee-Van, Jocelyn Crane, J. F. W. Pearson.

I now turn to a selection of volumes that I especially value, some perhaps for personal reasons, and most (not all) by scientists.

There is a great history of coral reef exploration in the tropics. The coral reef is as fascinating and almost as vast a biotic formation as is the tropical forest. My first glimpse of the life of the coral reef was in the West Indies. I was so sure that animals there reached a climax of color, of bizarre form, and of variety as to species, that only my personal view of the hundred times richer life of the reefs of Australasia could have convinced me that so much greater a wealth of form in



A glimpse of the Great Barrier Reef of Australia.

living creatures exists. The greatest extent of reef in the world is in the Great Barrier Reef of Australia. This has been the scene of the modern reef studies by the Great Barrier Reef Expedition, whose leader, C. M. Yonge, has presented a fine volume[2] in the best tradition of popular writing on a background of scientific investigation.

There is a considerable tradition of exploratory travel by women, perhaps especially by Englishwomen. Mary Kingsley is said to have

[2]Yonge, C. M., 1930. A year on the Great Barrier Reef the story of corals and of the greatest of their creations. G. P. Putnam's Sons, New York, xx+246 p., illus.

been a redoubtable character, and her *Travels in West Africa*[30] bears out her personal reputation. Few women have been both naturalists and travellers. Maud Haviland's *Forest, Steppe, and Tundra,*[31] often cited as an ecological reference, is perhaps a little more formidably armed with scientific names and lists of references than most books in the present list. It is the more excellent a book for the naturalist's library, for popular writers all too often underestimate the intelligence of the general public (and, it may be added, especially that of chidren). Evelyn Cheesman's travels as an entomologist are only known to me from scattered essays and from her excellent volume, *Hunting Insects in the South Seas.*[32] She seems to be a hardy successor to Miss Kingsley's tradition.

Through Southern Mexico,[33] by Hans Gadow, is an only occasionally tiresome record of an eminent anatomist's travels and collecting experiences. Aside from the fact that he was able to travel with his wife, which is all too rare a privilege for naturalists, one of his modes of travel was unique. He arranged for the loan of a boxcar from the Mexican National Railways, fitted it up with collecting supplies, cots, tables, and cooking equipment, and had the resulting travelling laboratory shunted from siding to siding in Vera Cruz and Oaxaca. No private car could have been so effective for a naturalist's use.

There are too few records of the romantically interesting search for fossils, whether for the fossil remains of the older rocks and of marine beds or for the more conspicuous mammals and reptiles. One such account by George Gaylord Simpson, one of the most thoughtful scientists of our generation of zoologists, is successful in conveying vivid impressions of the climate, of the landscape and of the search for fossils in it, and of the human associations of the bleak plans of Patagonia. Charles Sternberg the elder has left an account of the life of a free-lance "bone digger."[34]

The later books of Frank M. Chapman, who was mentioned above for his early promotion and practice of wild bird photography, represent the by-product from an active scientific career. This relation be-

[30]Kingsley, Mary H., 1897. Travels in West Africa. Macmillan Co., New York, xvi+743 p., illus.

[31]Haviland, Maud D., 1926. Forest, steppe and tundra studies in animal environment. Cambridge University Press, 1+218 p., 8 pl. and 8 fig.

[32]Cheesman, Evelyn, 1932. Hunting insects in the South Seas. Philip Allan and Co., London, xi+243 p., 8 pls.

[33]Gadow, Hans, 1908. Through southern Mexico being an account of the travels of a naturalist. Witherby and Co., London, xvi+527 p., illus.

[34]Simpson, George Gaylord, 1934. Attending marvels a Patagonian journal. Macmillan Co., New York, xiii+295 p., illus.

Sternberg, Charles H., 1909. The life of a fossil hunter. Henry Holt and Co., New York, xiii+286 p., illus.

tween science and popularization is an admirable one, envied by biologists who cannot write, and emulated by those who attempt writing. The desire to engage in such a literary side line is so wide-spread that many scientists are prejudiced against the popular writers who (in a British Museum phrase) come to "suck their brains." I have no great sympathy with such prejudice; it is too closely allied to the "ivory tower" aspect of scholarship. Chapman's scientific career, meanwhile, requires comment in relation to Wallace's strictures on the "Expedition." Having established an interest in the birds of the American tropics, an ornithological survey was set up for the South American continent, planned and executed under Chapman's direction. Had this survey been biological in aim instead of ornithological, it would command still greater respect. Such planned field work, continued over a period of years, tends to meet Wallace's recommendations. I may digress to mention the greatest of monuments to such a program of descriptive biology—the 63 quarto volumes of the *Biologia Centrali-Americana,* which was concluded in our own times, though field work for it began in 1857. The report on the beetles alone occupies seven volumes, so bulky that they are bound in eighteen. The story of this noble project, which grew out of a boyhood friendship, is told by Frederick Ducane Godman in the introductory volume[35] (published last, in 1915).

What I started to say about Chapman is that his two volumes of essays on the life of Barro Colorado Island[36] in the Canal Zone are intrinsically valuable, and important also to American biologists as a sign-post to this most accessible of tropical biological stations. The little-known *Jungle Island*[37] (for juvenile readers), by Mr. and Mrs. W. C. Allee, gives some picture of the station at the time of its origin; and the history of its establishment is interestingly set forth in the current "best seller" (in travels by naturalists), *A Naturalist at Large.*[38] The essayist-naturalist Dallas Lore Sharp, something of a favorite of my own, reflects what seems to be a rare adverse impression of the tropical forest in an account[39] of his brief visit to "B. C. I.", as it is now known to hundreds of biologists who will join me in affectionate remembrance of an eminent Panamanian (and sometime Chicagoan), James Zetek, who was there our "guide, counselor, and friend."

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[35]Godman, Frederick Ducane, 1915. Biologia Centrali-Americana. Zoology, Botany, and Archaeology. Edited by Frederick Ducane Godman, and Osbert Salvin. Introductory volume. viii+149 p., 8 maps, 1 pl.

[36]Chapman, Frank M., 1928. My tropical air castle nature studies in Panama. D. Appleton and Co., New York, xv+417 p., illus.

———— ———— 1938. Life in an air castle nature studies in the tropics. D. Appleton-Century Co., New York, xii+250 p., illus.

[37]Allee, Warder C. and Marjorie Hill Allee, 1925. Jungle island. Rand McNally and Co., Chicago, x+215 p., 85 fig.

[38]Barbour, Thomas, 1943. Naturalist at large. Little, Brown and Co., Boston, xii+314 p., illus.

[39]Sharp, Dallas Lore, 1930. Machete trails. *Atlantic Monthly,* Vol. 145, p. 749-758.

A region of remarkable and illuminating geographic interest is one of the most barren deserts of the world, sometimes with no spear of vegetation for miles on end, or on whole islands. The geographic and climatic paradoxes of the cool desert of coastal Peru and its off-shore islands have a simple explanation. Peru has completed its share of the Pan-American highway in fine black-top all-weather road (sometimes, to be sure, with no barrier at the edge of a half-mile deep precipice). When this dream highway begins to bear the stream of trucks and touring cars and jeeps that can be expected to increase its natural hazards in the post-war era, I hope the travellers will look up *Bird Islands of Peru,*[40] and thus find the desert highway as interesting as it was to me.

One book about travels in South America has a unique value to the museum zoologist. It tells how *not* to organize an expedition for scientific study, and what *not* to do on one; and it tells these things in an absorbing running account of an actual comedy of errors in the jungle that is by far more effective than any admonishments of what *to do* could ever be. The identity of the expedition members has been a carefully guarded secret, but with the lapse of time it might be permissible to divulge their names if the reader is interested.[41] The book is *Black Waters and White;*[42] it is much more worth reading for a story of the foibles of a scientific party than for the observations of its author about his own travels. A distinguished member of the party has assured me that its story is at least more than half true, and that some of the least credible (and creditable) statements are entirely so.

There is an interesting literature about whaling; some of the explorers of the arctic and antarctic regions have been naturalists of note. I have left out whole regions and whole sets of books that might well be listed, but my space is at an end. I have enjoyed naming over some much-loved volumes, some read and re-read, some stored on my shelf in the hope that I may yet find time to do more than scan them. For readers who wish to keep up some acquaintance with travels accomplished in the interests of natural history, and whose funds are limited, the best recommendation is a subscription to the semi-popular journals, *The Animal Kingdom,* published bi-monthly by the New York Zoological Society, and *Natural History*, published ten numbers per annum by The American Museum of Natural History, also of New York City.

There is no sharp dividing line between popular writing and scientific, nor should there be. I have emphasized books of travel by natu-

[40]Murphy, Robert Cushman, 1925. Bird islands of Peru, the record of a sojourn on the West Coast. G. P. Putnam's Sons, New York, xx+362 p., illus.

[41]If requested of the author of this essay, send a stamped self-addressed envelope.

[42]MacCreagh, Gordon, 1926. White waters and black. Century Co., New York, viii+404 p., illus.

ralists as by-products of travels and investigations undertaken with a technical purpose. The contrary relation may of course appear, and it should be remembered that the development of amateur naturalists into biologists is the more to be welcomed as an antidote to scholasticism, i.e., to *The Dry-rot of Academic Biology,* and to the perils of *The Organization of Research.*[43]

DER BUCHERWURM

Carl Spitzweg's cartoon of the Bibliophile.

This is the third and last of a series of articles by Mr. Schmidt. A reprint of all three, under one cover, may be obtained from the Academy for twenty-five cents.—Ed.

[43]Wheeler, William Morton, 1928. Foibles of insects and men. Alfred A. Knopf, New York. xxvi+217+xi p., illus.

Museum Activities

Winter Sunday Lectures

The winter series of Sunday Afternoon Lectures starts January 2 and continues through February 27, 1944. These lectures, as usual, are free to the public.

The practice of issuing tickets is being discontinued. *Members of the Academy* may reserve places either by writing the Academy or telephoning LINcoln 0606 up to noon on the Saturday preceding the lecture. Reserved seats are held for members until 3 o'clock, when the lecture begins. A list of those who have made reservations will be checked by the guard when seating members and their guests, instead of using the blue tickets for admission to the reserved section. Members are urged to carry their membership cards for admission to the auditorium in case of late arrival.

Doors of the auditorium will be opened at 2:00, and it is recommended that non-members of the Academy arrive as soon as possible thereafter to be assured of seats. Auditorium doors are closed at 3:00.

Jan. 2: **The Canadian Pacific Rockies** (illustrated with colored slides), John R. Philp, World traveler and Lecturer, Chicago.

Jan. 9: **Tank Destroyers,** Army Training at Camp Hood, Texas (made in coöperation with the War Department) and **Loaded for War,** An Aroused Nation Moves into Action on Ribbons of Steel (Kodachrome motion pictures with sound), through the courtesy of the Santa Fe Railway System.

Jan. 16: **New England and the Gaspe Peninsula** (illustrated with Kodachrome stills), Elmer R. Nelson, Jr., Geologist and Lecturer, Milwaukee Public Museum.

Jan. 23: **Land of the Free** (Kodachrome motion picture), Sam Campbell, "The Philosopher of the Forest," through the courtesy of the North Western Railway Company.

Jan. 30: **Indians of the Southwest,** *Navajoland Today* and *The Corn Dancers* (Kodachrome motion pictures with sound), Willard W. Beatty, Director of Education, Office of Indian Affairs, U. S. Department of the Interior.

Feb. 6: **American Frontiers of the Southwest** (Kodachrome motion picture with musical setting), Ray Eggersted, Traveler and Lecturer, Elgin, Illinois.

Feb. 13: **Our American Southwest** (Kodachrome motion picture accompanied by recorded music), Victor H. Sickinger, Photographer, Wilmette.

Feb. 20: **Alaskan Wildlife** (Kodachrome motion picture), William B. Bell, Ph.D., Chief, Division of Wildlife Research, U. S. Fish and Wildlife Service.

Feb. 27: **What Makes a Picture?** (Scenes photographed in Kodachrome compared with landscapes painted by Old Masters, illustrating principles of technique), Louis J. Tint, M.D., Landscape photographer, Chicago.

Henry S. Henschen

As this issue went to press we received the news of the death of Henry S. Henschen, Trustee and former Treasurer of the Academy, on December 27, at his home in Evanston. We hope to publish a biographical sketch of Mr. Henschen in the forthcoming issue of *The Chicago Naturalist.*

Lobby Exhibits

The current exhibit of Illinois fur animals in the museum lobby will be replaced about February 1st by an exhibit on *Birds in Winter*. It is planned that one section of this display will show where our summer residents spend the winter months and the routes by which they travel. Other exhibit cases will demonstrate methods of providing food and shelter for year-round residents and winter visitors from the north. Normal diets will be shown as guides for setting up feeding station menus to attract various species. Background charts are furnished through the courtesy of the General Biological Supply House.

Cowles Botanical Awards

The winners of the awards offered by the Cowles Botanical Society this year to high school students for "excellence in original work in botany, either observational or experimental," were recently announced by Dr. Charles A. Shull, president of the society. Winners of first and second places will receive cash awards of twenty-five and ten dollars, respectively; winners of third and fourth places will receive books.

The awards to be made are as follows: First place—William Jensen, 2051 N. Kedvale Avenue, Chicago, Kelvyn Park High School, subject "Effects of Common Stimulants on Plants;" second—Robert Kral, Oak Park and River Forest Township High School, "Once Upon a Time;" third—Dorothy Weiner, Von Steuben High School, "The Plant Ecology of a Prairie;" fourth—David Heizman, Waller High School, "The Development of Catkins and Leaves on the Cottonwood Poplar."

Mr. Jensen and Mr. Kral have been asked to read their papers at the next meeting of the society, January 11, 1944, 8:00 P. M. at the Academy. The awards will be presented at this time. Friends, fellow-students, teachers, and others interested are cordially invited to attend.

Earlier in the year the Cowles Botanical Society sponsored two symposia for the purpose of suggesting experimental projects to students who might wish to submit papers for consideration by the judges. The society thus hoped to assist in the direction of the botanical interests of talented students. In view of the interest shown, the society has decided to offer a similar award as a part of its 1944 program.

Academy Host to Midwest Botanists

Botanists of the midwestern region met at the Academy on December 29 and 30. Papers were presented by representatives from the following institutions: The University of Iowa, Northwestern University, University of Illinois, University of Chicago, Indiana University, Illinois State Natural History Survey, University of Wisconsin, Water Purification Division of Chicago, and Purdue University.

Dr. L. H. Tiffany, Dr. John T. Buchholz, and Dr. John M. Beal were chairman of the three sessions, and Dr. Charles A. Shull served as toastmaster at the dinner held at the Webster Hotel on Wednesday evening, December 29. Arrangements for this informal convention were made through Dr. S. V. Eaton of the Department of Botany, the University of Chicago.

Staff Notes

Edward R. Ford, honorary curator of birds, spent a few weeks at the Academy recently before going to Fort Lauderdale, Florida, for the remainder of the winter.

Audubon Society Lectures

The Illinois Audubon Society, in coöperation with the National Audubon Society, has arranged a series of five public lectures for the 1943-'44 season. This series is unusually fine in both scope of subject matter and calibre of speakers. All lectures are illustrated with motion pictures in natural color.

Audubon Society lectures are presented in the Academy auditorium at 8:00 P.M. There is no charge and all who are interested in the study of birds and conservation of wildlife are invited to be present.

On November 12, Bert Hartwell presented his film, *Wings Over the Desert*, with an accompanying informal talk and bird imitations. On Tuesday, January 18, John H. Storer will show his motion pictures of eastern North American wildlife, *Wings, Fins and Antlers*.

Other lectures are scheduled as follows:

March 1 (Wednesday): Alfred M. Bailey, (subject to be announced).

March 18 (Saturday): *Wildlife in Action*, Olin S. Pettingill, Jr.

April 7 (Friday): *A Naturalist Afield, Afloat and Aloft*, Alexander Sprunt, Jr.

May 4 (Thursday): *Our Heritage in the Rockies*, Edna Maslowski.

Walter A. Grau now Treasurer of the Academy

At a meeting of the Board of Trustees of the Academy on December 1, 1943, Walter A. Grau was elected Treasurer of the Academy to succeed John Nash Ott, Jr., now serving with the armed forces. Mr. Grau is an assistant cashier of the First National Bank of Chicago.

Recent Visitors

Among museum visitors during recent weeks are Dr. Warren N. Keck of Coe College, Cedar Rapids, Iowa; Earl G. Wright, Director of the Neville Public Museum, Green Bay, Wisconsin; and Dr. and Mrs. Donald C. Lowrie of De Pauw University, Greencastle, Indiana.

Trustees in the Armed Services

Three trustees of the Academy are now serving the nation in the armed forces: Hulburd Johnson is a First Lieutenant in a Field Artillery battalion on maneuvers in California; Lloyd A. Laflin is a Lieutenant in the U. S. Naval Reserve, stationed in Florida; and John Nash Ott, Jr., is at the U. S. Naval Training Station, Farragut, Idaho.

Recent Gifts to the Museum

Recent gifts to the Academy's Museum of Natural History include two herbarium collections of historical interest: one—mainly collected in the Chicago region in 1838—the gift of the Chicago Historical Society, and the other—collected between 1790 and 1840—the gift of Hans R. W. Werner, staff artist of that institution.

Mr. A. Krause presented a collection of 34 mineral specimens to be used for educational purposes, and the study collections were augmented by 26 specimens of Illinois and Ohio fungi from Dr. V. O. Graham, two shipments of mammal skins and skulls from Georgia from Roy and E. V. Komarek, and 27 more bird skins and 10 sits of eggs collected in Alaska by Charles D. Brower. A case containing 66 mounted hummingbirds and other cases displaying game birds were presented to the Academy by the Francis Parker School.

Recent Acquisitions to the Library

A set of twelve volumes on the work of Luther Burbank has been given the Academy Library by Mrs. H. C. Arms. Other books and periodicals on botanical subjects have been presented by the Cowles Botanical Society, Dr. Charles Shull, Mrs. Anna P. Kummer, Dr. Paul Voth, and the Florida Park Service.

Literature in the field of ornithology has been given the Academy by Edward R. Ford, Roberts Mann, and W. A. Gray; in popular medicine by Dr. N. S. Davis and E. L. Moseley; in herpetology by Dr. H. K. Gloyd; and in entomology by the Chicago Entomological Society.

A Field Manual for Museums by Ned J. Burns and Ellsworth Jaeger's *How to Camp Out if You're Bombed Out* were gifts of the authors.

A number of recent popular books on various aspects of natural history have been placed in the Reading Room, as are all books reviewed in *The Chicago Naturalist*, so as to be readily available to all who may wish to read them.

Notes from the Field

A Red Fox Watches the Clock

The common or eastern red fox is considered to be a wild, sly animal whose main idea is to raid the henroost, who sleeps in the middle part of the day, hunts for food in the hours of twilight and darkness, and feeds irregularly.

My experience with an individual of this species in August, 1943, at Lake Mansfield, Stowe, Vermont, indicates that this animal may be regular in feeding, and come to the same place daily in broad daylight. I saw him first while I was fishing from a boat on the lake. He was following

From a Kodachrome by the Author

the shore line, evidently seeking food. My first thought was to get a kodachrome picture of him.

I assumed that he was hunting for frogs but found that while frogs were not plentiful minnows were. Now to bring my subject out of the woods to a certain spot at a time of day when the light would be sufficient for a picture. At least it was worth trying. A survey was made of the shore line and logs extending into the lake were located. On these I placed dead minnows, freshly caught, at 10:00 A.M. every day for two weeks.

For a time I watched the fox from the boat; afterward from a concealed spot near the logs. To my surprise he would come to the fish and pay little or no attention to me if I kept quiet. At one time he pulled on the rope which fastened the boat to a stump while I sat on a log five feet away. Again he passed me on a log, within easy reach, while I sat on a stump.

He came for the minnows first at about 11 o'clock and then began to come earlier. In a few days the meal was taken at 10:30, and then, soon after it was placed on the log. It is my belief that he was waiting rather than I.

Did my red fox reason from cause to effect? No one can say. But at least his actions indicated a process of thinking.

J. M. Hollister.

The Naturalist's Book Shelf

The Book of Fishes

By John Oliver La Gorce (editor) and others

National Geographic Society, Washington, D.C., 1939. 367 pages, 605 illustrations (443 in color), index. $3.00.

Eleven complete articles which have appeared formerly in the National Geographic Magazine have been brought together in this handsome volume. Nine authorities on fishes have made excellent contributions and Dr. John Oliver La Gorce has written a short foreword.

The volume is so broad in its scope that anyone interested in any phase of fish life or in fishing as a sport or as a commercial project will read it with profit. The naturalist will be fascinated by the 443 beautiful color portraits of fishes and other marine animals. The professional ichthyologist will find it very profitable to examine the accurate illustrations and the numerous life histories including records of distribution and of breeding habits. The commercial fisherman and marketeer will read interesting historical accounts of the abundance and scarcity of the fishes and other animals of which he talks. He will be interested to discover the reasons for the scarcity or abundance and of the efforts of qualified experts to prevent extermination of important animals. The angler who is prevented from visiting his favorite haunts because of transportation difficulties will revel in the many fine action photographs and will enjoy vicariously the leap of a tarpon or a catch of trout.

The stated objective of the volume "of bringing together in a single volume the most comprehensive factual presentations yet published in full color of the better known species of our inland and coastal waters" has been amply fulfilled.

C. L. Turner.

Bird Display; an Introduction to the Study of Bird Psychology

By Edward A. Armstrong

Cambridge: At the University Press; New York: The Macmillan Co., 1942, 381 pages, 22 plates. $5.50.

Mr. Armstrong has written a fascinating book on a fascinating subject. Beginning with an account of the communal life of the gannet, as a type species illustrating ceremonial behavior, he presents chapters in suitable order on each kind of display—courtship feeding, gaping, injury-feigning, and so on through the entire range of avian posturing and reaction.

The author has supplemented his own observations, investigations, and conclusions with those of others—how thoroughly is shown by some six hundred biographical references. His interpretations, like those of the scholars he cites, are not always convincing to the lay reader, but they are always provocative.

Display is the sign of emotional excitement and entirely different emotions may be expressed by the same sort of display. Chance results of certain types of display have originated permanent behavior patterns. However, to this reviewer it does not seem that nest building owes its origin in large part to the adventitious result of fidgeting with grass, weeds and the like.

Careful to avoid "over-humanization," the author does not shrink from the use of parallels. To say because of its pose that a bird wears a guilty or dejected air is to say no more than that the tail-wagging of a dog indicates pleasurable emotion.

To the average lay reader the book will re-assert that all activities of all organisms have for their end purpose, directly or indirectly, the continuation of the species and that for this purpose every species is psychologically and physiologically equipped. How this equipment is used, as understood by those whose researches have made possible such a work as Mr. Armstrong's, is thoroughly and thoughtfully considered. To many readers many of the facts recorded will be new and sometimes startling. Not the least pleasing parts of the work are the philosophical and often poetical reflections with which many of the chapters close.

Edward R. Ford.

Vegetable Dyes

By Douglas Leechman

Oxford University Press, Toronto, 1943. 55 pages, paper cover. $0.35.

Amateur botanists and hand-craft hobbyists will find in Dr. Leechman's new handbook, *Vegetable Dyes,* a practical introduction to a fascinating craft activity and a source of interesting information to add to their individual funds of nature lore.

In the less than a century since the first analine dye was introduced (1856) much of the accumulated experience of hundreds of generations of dyers, whose recipes our great-grandmothers treasured along with those for home remedies and culinary specialties, has already been lost. The service of Dr. Leechman's handbook to those of antiquarian interests lies more in the opportunity it offers of reviving an appreciation of this home craft than in presenting a compendium of information pertaining to it.

Only plants readily obtainable in the northern United States and easily recognized are discussed. They are listed alphabetically by popular and scientific name, with accompanying recipes, and are also named under the color they produce. A single basic recipe each for preparing dye bath and mordant is given, with modifications of procedure and helpful hints added in the sections on specific dye plants. The author deals primarily with the dyeing of wool, warning that results with cotton and wool are less dependable.

Dr. Leechman effectively answers the logical question "Why bother with vegetable dyes at all, now that chemical dyes have been developed to such a high degree?" by pointing out that: (a) they lend a subtle warmth and richness of tone not readily obtained in commercially-dyed materials (and very rarely by the amateur using chemical dyes), (b) they give the final touch of authenticity to hand-made articles, and (c) they're fun to experiment with. We might add to item (c) the added pleasure of outdoor roaming, whether incidental to the collecting of dye-plants or vice versa.

Harriet M. Smith.

Trail of the Money Bird

By Dillon Ripley

Harper and Brothers, New York and London, 1942, xii, 306 pages, 18 halftones. $3.50.

This is a delightfully written account of a scientific voyage to the South Seas. It deals in large part with the author's experiences in quest of ornithological specimens in northwestern New Guinea. His observations on the birds of paradise and the bower bird are especially noteworthy, but there is much of interest about the people, the animal life, vegetation, topography, and climate of this little known island. A charming narrative style is maintained throughout and any but a most unimaginative reader can feel actual participation in the enthusiasms, delights, and discomforts of Dillon Ripley and his helpers. For a vivid and authentic picture of a region paradisial for a naturalist, and doubtless for its native population—a part of the world now conspicuously and unhappily in the news—this book is preëminently satisfying.

H. K. Gloyd.

Natural History with a Camera

By L. W. Brownell

American Photographic Publishing Co., 353 Newbury St., Boston, 1942, xii, 292 pages, 116 halftones, index. $3.75

Twelve of the thirteen chapter headings of this book are the names of the months — March through February. The author explains: "Instead of commencing our nature studies with the calendar year, it has seemed more appropriate to follow nature more closely and begin with her own fiscal year which starts in March. It is then that Mother Earth wakes up from her winter slumber and starts into operation that progression of growth, bloom, and fruit, and of giving birth to young, hatching eggs, and raising the offspring to maturity, that makes the endless cycle of her charms." Then follows, in essay style, an informal, descriptive enumeration of plants, trees, blossoms, fruit, insects, amphibians, reptiles, birds, etc., which from month to month are considered especially good subjects for the nature photographer.

The illustrations, from photographs by the author, are carefully chosen and represent an exceedingly wide range of subjects. One who has seen original prints by Mr. Brownell, and who knows his characteristically high standards, will not be satisfied with some of the reproductions.

In the first chapter of the book, headed "Equipment," are general comments on cameras, lenses, shutters, tripods, exposure meters, film and paper emulsions, and similar subjects. These remarks are to the point and obviously based on long experience but some readers may wish that these tools of the photographer had been discussed at greater length. In the way of methods little is added to what is more or less generally known. "Blinds" and long-range shutter releases for photographing birds, tanks for confining fish, frogs, and salamanders, and cages for restraining small mammals, lizards, and snakes have long been in common use. Nothing is said about specialized techniques such as night photography, "set-cameras," natural color processes, or motion pictures.

This reviewer could not escape the feeling that Mr. Brownell, perhaps unconsciously, is attempting to interest photographers in natural history subjects rather than to aid naturalists in making better pictures.

H. K. Gloyd.

Studies in the History of Science

By a panel of authors listed below.

University of Pennsylvania Press, Philadelphia, 1941, 123 pages, 10 figures. $1.50.

The eight scientific papers in this volume were published in recognition of the University of Pennsylvania's Bicentennial Conference. Each of the authors is a professor at an outstanding university and a recognized authority on the subject on which he writes.

Ancient and modern aspects of Cultural History, Astronomy, Mathematics, Medicine and Surgery, Logic and Schools of Scientific Thought are treated under the following titles: *Ancient Mesopotamia and the Beginnings of Science,* by E. A. Speiser, University of Pennsylvania; *Some Fundamental Concepts in Ancient Astronomy,* by Otto E. Neugebaur, Brown University; *Medicine and Surgery in Ancient Egypt,* by Hermann Ranke, University of Pennsylvania; *Medieval Medicine,* by Henry E. Sigerist, Johns Hopkins University; *The Rise of Modern Scientific Medicine,* by Richard H. Shryock, University of Pennsylvania; *Two Centuries of Surgery,* by Evarts A. Graham, Washington University, St. Louis; *Logico-Historical Study of Mechanism, Vitalism, Naturalism,* by Edgar A. Singer, University of Pennsylvania; *The Mathematical Way of Thinking,* by Hermann Weyl, Institute for Advanced Study.

How's Inky?

By Sam Campbell

Bobbs-Merrill Company, Indianapolis and New York, 1943. 135 pages, illustrated with sketches in ink by Bob Kuhn. $1.50.

Those who know Sam Campbell, "the Philosopher of the Forest," through his lectures, radio talks, and articles, are also acquainted, by means of motion pictures and anecdote, with his pet porcupine, Inky. This self-sufficient yet friendly little animal has so impressed his personality on the city-dwelling public that Mr. Campbell is usually greeted, not by the conventional inquiries as to his own health and prosperity, but by the invariable query, "How's Inky?"

Apparently Inky's in fine fettle and so are his fellow refugees at Wegimind, Mr. Campbell's sanctuary in the north woods. Bobette the fawn, Sausage the ground hog, and Rack and Ruin twin raccoons, were all brought to the Sanctuary during the same summer as orphan babies. The story of their tempestuous up-bringing and continued friendship—with each other and with the human friends who protected them but allowed them to grow to an independent, natural wild adulthood—is told in a delightfully amusing series of anecdotes, which are enlightening as well as entertaining. Bob Kuhn's appealing sketches illustrate well-chosen incidents and are very effective.

Nature lessons and lessons in living, on the themes of individuality, patience, home, courage, and friendliness, are charmingly interwoven with straight narrative in typical Sam Campbell style. Much of the philosophy may be summed up in the following quotations: "Thus as we study living things—plants, animals, or human beings—we find in each one *characteristics* in which it resembles its kind, but also *character* which makes it original and individual," and " . . . any two things that know life can be friends."

Harriet M. Smith.

How to Know the Spring Flowers

By Mabel Jaques Cuthbert

Published by H. E. Jaques, Mt. Pleasant, Iowa, 1943. 168 pages, 434 figures, glossary-index. Spiral binding $1.50, cloth binding $2.50.

Another manual—*How To Know The Spring Flowers*—of the charming Pictured-Key Nature Series has appeared. This number is as compact as earlier ones, its spiral binding even more attractive.

For any field worker, the efficiency and usefulness of a taxonomic key will depend to a great extent upon his ability and experience in observing and in interpreting observations accurately. The Pictured-Key Nature Series eliminates the hazard of wrong identifications insofar as is possible. The beginner is aided at every conceivable step — by simplified terms, descriptions, and by the numerous, well-placed illustrations which supplement and clarify the text. Amateurs will surely find this clear, simple presentation a valuable aid.

The body of the manual is comprised, of course, of the keys to the spring flowers. Some naturalists will perhaps regret the omission of the grasses, sedges, and rushes. Others will note the failure to include some species ordinarily considered spring flowers. Nevertheless, a prodigious amount of time and effort has obviously been expended in the preparation of the book. More than three hundred herbaceous species of the United States and southern Canada are keyed, discussed, and illustrated—the excellent line drawings, largely from the pen of the author herself, constitutes an important feature of the manual.

In addition to the keys, several shorter sections have been included, and those on plant parts and their functions, the preparation of herbarium specimens, the check list of species by families, and the pictured glossary-index seem especially appropriate and commendable.

Kathryn J. Stephenson.

Practical Emulsions

By H. Bennett

Chemical Publishing Co., Inc., Brooklyn, N. Y., 1943, vii, 2 parts, 452 pages, index. $5.00.

Practical Emulsions, as its name concisely delimits, is a *practical* treatise in that portion of economic chemistry which deals with the permanent mixture of mutually insoluble liquids. Its author is editor-in-chief of *The Chemical Formulary*.

The first part, "General," is of necessity quite technical. The section on what and why is an emulsion will b of interest to (and comprehensible by) the industrial chemist rather than the layman. The discussion of causes and prevention of instability in emulsions, however, should repay the purchase price of the book to anyone who has occasion to use or make emulsions in his laboratory or home workshop activities.

The second part, "Formulas," which groups recipes according to their use—as cleaners and soaps, cosmetics and drugs, food emulsions, polishes, lubricants, textile emulsions, etc.—is as non-technical as a cook book, and as usable.

An index for volume 5 and 6 of *The Chicago Naturalist* will be mailed to libraries and institutional exchanges with num-1 of volume 7. Members of the Academy and individual subscribers may obtain these without charge on request.

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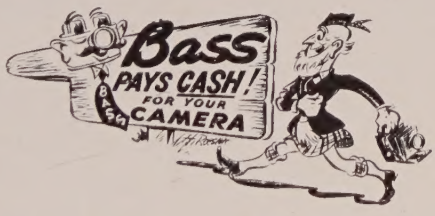

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